

atggcttcctcagttctttcctctgcagcagttgccacccgcagcaatgttgctcaagct
M A S S V L S S A A V A T R S N V A Q A

aacatgggtgcacctttcactggccttaagtcagctgcctcattccctgtttcaaggaag
N M V A P F T G L K S A A S F P V S R K

caaaccttgacatcattccattgccagcaacggcggaagagtgcaatgcatgcaggtg
Q N L D I T S I A S N G G R V Q C M Q V

tggccaccaattaacaagaagtcc

(SEQ ID NO:3)

W P P I N K K S

(SEQ ID NO:4)

Figure 1

0933947-042001

(CaMV 35S) ggtaccaaaaaaaaaaccATGgcttcctcagttcttcctctgcagcagttgccacccgcagcaatgttgctcaag

M ssRubisco transit KpnI

ctaacatggttgacctttcactggccttaagtgcgtgcctcattccctgtttcaagggaagcaaaaccttgacatcacttccatt

gacagcaacggcggaagtgaatgcATGCAGGTGTGGCCACCAATTACAAGAAGTCCATG-----Ccttttataaaa

ssRubisco mature Alfalfa ACCase 3' ACCase sequences

aaaaaaaaaagaattcctgcagccccggggatcc (SEQ ID NO:5)

pAMP1 vector BamHI sequences

-

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atggctagcgtgggcccgtggaaatggatatTTTaaacagtgtgctaccgagtaggcaccctgctactacaaccgaa
M A S V G R G N G Y L N S V L P S R H P A T T T E
gtagatgaatactgcaatgcccttggaggaaacaagccgattcatagcatattgattgcaaacaatggaatggca
V D E Y C N A L G G N K P I H S I L I A N N G M A
gcagtcaagttttatacgtagtgttaggagttgggcttacgagacatttggcacggaaaaagctatcttgttggtt
A V K F I R S V R S W A Y E T F G T E K A I L L V
gccatggcaactccagaggatatgagaatcaatgcagaacatatcagaatagccgatcaatttgtggaagtacct
A M A T P E D M R I N A E H I R I A D Q F V E V P
ggtgggaccaataacaataactacgccaatgtgcagcttattctagagattgctgagataaactcacgttgatgcg
G G T N N N N Y A N V Q L I L E I A E I T H V D A
gtgtggcctggttggggtcatgcacagaaaatcctgagcttccagatgcattaaaagcaaagggaattgtattc
V W P G W G H A S E N P E L P D A L K A K G I V F
cttgacctcctgctatatctatggcagcattgggagacaaaattggttcctcgttgattgctcaggcagcagaa
L G P P A I S M A A L G D K I G S S L I A Q A A E
gttccaacccttccatggagtggttctcatgtgaaaattcctccagaaagtgaattgattactattcctgatgaa
V P T L P W S G S H V K I P P E S D L I T I P D E
atttaccgtgcagcatgtgtttatacaacagaagaagcaattgcaagttgtcaagtagtaggttaccctgcaatg
I Y R A A C V Y T T E E A I A S C Q V V G Y P A M
attaaggcatcttggggtggtggcggaaggcataagaaagggttcataatgatgatgaggttagggcattgttc
I K A S W G G G G K G I R K V H N D D E V R A L F
aagcaagttcaaggtgaagtaccaggtcacctatatTTTataatgaaagttgcttcccagagccgacatcttgaa
K Q V Q G E V P G S P I F I M K V A S Q S R H L E
gtccaattgatttgcgatcagcacggaaatttgcagcattgcacagccgtgattgtagtgttcaaagaaggcat
V Q L I C D Q H G N F A A L H S R D C S V Q R R H
caaaagattattgaagaggggtcccattactgtagcacctccagaaacggtgaaagaacttgaacaggcggctaga
Q K I I E E G P I T V A P P E T V K E L E Q A A R
agattagctaaatctgtaaattatgtgggggcagctaccgttgagtatctttatagcatggaaactggcgagtac
R L A K S V N Y V G A A T V E Y L Y S M E T G E Y
tacttttttagagttgaacccccgactacaggttgagcatcctgttactgaatggatagctgagataaatctgcca
Y F L E L N P R L Q V E H P V T E W I A E I N L P
gcagcacaagttgcagttgggatgggcatccactctggcaaattcctgagattaggcggttctatgggatggaa
A A Q V A V G M G I P L W Q I P E I R R F Y G M E
catggtgggggaaatgatggttgggaagaaaacatcagtggttagctacccttttgattttgacgaagcacaatct
H G G G N D G W K K T S V L A T P F D F D E A Q S

Figure 4-1

Figure 4-2

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agctcccaaactattgatttccctgccaaattattgaaggcaatccttgaagctcatctttcctcctgtcctgaa
S S Q T I D F P A K L L K A I L E A H L S S C P E
aacgaaaaaggagccttagaaagactagttgaaccgctgacaagtcttgtaaagtcttatgaggggtggaagagag
N E K G A L E R L V E P L T S L V K S Y E G G R E
agccatgctcataaaattgttcaatctctatttgaagagtatctttcagttgaagaactattcagtgataatata
S H A H K I V Q S L F E E Y L S V E E L F S D N I
caggctgatgtaattgaacgactccgtcttcaatacaagaaagatttgggtgaagattgtagatattgtgctctct
Q A D V I E R L R L Q Y K K D L L K I V D I V L S
catcaggggtgtcaagagcaaaaaacaagctgatactgcgactaatggataaactggtttaccctaatacctgctgcc
H Q G V K S K N K L I L R L M D K L V Y P N P A A
tatagggatcaattaatccgattctcccaactcaaccatatagtttattctgagttggctcttaaggcaagtcaa
Y R D Q L I R F S Q L N H I V Y S E L A L K A S Q
ctgttgagcaaaactaaactcagtgaaacttcgatccagcattgctagaagtctttctgaactagaaatgtttacc
L L E Q T K L S E L R S S I A R S L S E L E M F T
gaggatgggtgaaaatattgatactccgaagaggaagagtgccattaatgacagaatggaggaccttgtgagcgct
E D G E N I D T P K R K S A I N D R M E D L V S A
cctttggctggttgaagatgcccttgggtttatttgatcacagcgatcacacccttcaaaggagagttggtgaa
P L A V E D A L V G L F D H S D H T L Q R R V V E
acttatatccgtaggctctatcagccatatcttgtcaaagatagcatcaggatgcagtggcacagatctggcctt
T Y I R R L Y Q P Y L V K D S I R M Q W H R S G L
attgctacatgggaattcttagaagaatacgttgaacggaagaatgggggttgaagacaaaactgggtggagaaa
I A T W E F L E E Y V E R K N G V E D K T L V E K
catagtgagaagaaatggggagtgatgggttgaattaaatctcttcagtttttggcagcaattatcagtgctgca
H S E K K W G V M V V I K S L Q F L P A I I S A A
ttaagagaagcaaccaataactttcacgatcctcttaaaagtgggttctgggtgactcaagtaaccatggtaatatg
L R E A T N N F H D P L K S G S G D S S N H G N M
atgcatattggattagtggggatcaacaaccaaagagtttacttcaagacagtggtgatgaggatcagggtcaa
M H I G L V G I N N Q M S L L Q D S G D E D Q A Q
gaaagaattgataagttggccaaaatactcagagagcaggaaatagggtccataatacatgctgcaggtggttggga
E R I D K L A K I L R E Q E I G S I I H A A G V G
gatattagctgtatcatacagagggatgaagggcgctccaatgaggcattcctttcactgggtcatctgaaaag
D I S C I I Q R D E G R A P M R H S F H W S S E K
ctatattatgtagaggaaccattgttgctccatcttgaacctcccctatccatttatcttgaactggacaagctt
L Y Y V E E P L L H L E P P L S I Y L E L D K L

Figure 4-3

0983947 042001

aagtgcctatgaaaatattcgctatacaccatcccagatcgctcaatggcacctctacacagttgtggataccaag
K C Y E N I R Y T P S R D R Q W H L Y T V V D T K
ccacaaccaattcaaagaatgtttcttcgaacacttatcagacagccaaccacaaatgaaggatactcttcttat
P Q P I Q R M F L R T L I R Q P T T N E G Y S S Y
caaagactggatgcagaaacgtcccgtacccaattggctatgtcttatacttcaaggagcatttttaggtcccta
Q R L D A E T S R T Q L A M S Y T S R S I F R S L
atgggcgcaatggaggagttggaacttaactcacacaataccaccatcaaactgaacatgctcatatgtacctc
M G A M E E L E L N S H N T T I K S E H A H M Y L
tatatcatacgcgagcagcaaatagatgatcttgtgccttattccaagaaaattaacatagaagctggccaagaa
Y I I R E Q Q I D D L V P Y S K K I N I E A G Q E
gaaacaacagttgaggcaatcttgaagaactggcacaggaaatccattcctctgttggtgtaagaatgcacaga
E T T V E A I L E E L A Q E I H S S V G V R M H R
ttaggcgttttcgtgtgggaaatcaagctctggattacagcatgtggacaggcaaaggtgcttgagggtcatt
L G V F V W E I K L W I T A C G Q A N G A W R V I
gtaaacaatgtgactgggtcatacatgcactgtacatatatcgagagatggaggatgccaccactcataaagtg
V N N V T G H T C T V H I Y R E M E D A T T H K V
gtctacagttcagtcactgtaaagggtccgttgcatgggtgtaccggtgaatgaaaactatcaacctttgggaggt
V Y S S V T V K G P L H G V P V N E N Y Q P L G G
attgaccgaaaacgtcttgcagcgagaaagaacagcaccacatactgctatgatttcccccttgcatttcaaaca
I D R K R L A A R K N S T T Y C Y D F P L A F Q T
tccttgaacagtcctgggtcaatacagcagacaggaattcaaagagctaatagataaggatctcctaaaagtaaca
S L E Q S W S I Q Q T G I Q R A N D K D L L K V T
gagcttaaatatttccgaaaaagctggtagttgggtacttctcttggctcgcagagcgtcttctggactcaat
E L K F S E K A G S W G T S L V P A E R L P G L N
gatgttggcatggtagcctgggtgatggaaatgtgtacgcctaaattcccatctggaaggacaatattggttgtt
D V G M V A W L M E M C T P K F P S G R T I L V V
tcaaacgatgtgaccttcaaggccgggtcttttggcccaagagaggatgcattcttttagagcagtaactgatctt
S N D V T F K A G S F G P R E D A F F R A V T D L
gcctgtgcaaagaaaatacctttaatttacttggcagcaaattctgggtgcccgttttaggtgttggcgaggaagtc
A C A K K I P L I Y L A A N S G A R L G V A E E V
aaagcttgtttcaaagttggttgggtctgaggaatctaaacctgaacatggttttcagtatgtatatttaacacct
K A C F K V G W S E E S K P E H G F Q Y V Y L T P
gaggattatgctcgaatcggatcatcagtgatggcacatgaattaaagcttgaaagtgagaaaccagatgggtt
E D Y A R I G S S V M A H E L K L E S G E T R W V

Figure 4-4

09839477-042001

atagataccattgttgcaaagaagatggactgggagttgaaaacttgagtggtagtggggccattgccggtgcc
I D T I V G K E D G L G V E N L S G S G A I A G A
tattcaagggcatacaaggaaacctttacattgacatatgttaccggtaggactgttggattggtgcttatctt
Y S R A Y K E T F T L T Y V T G R T V G I G A Y L
gctaggcttgggatgaggtgcatacagaggcttgatcaacctataattcttaccgggttttcagcattaacaaa
A R L G M R C I Q R L D Q P I I L T G F S A L N K
cttcttggtagggaggtgtacagctctcacatgcaacttggtagccgaaaatcatggcaacaaatggagtcggt
L L G R E V Y S S H M Q L G G P K I M A T N G V V
catctcacagtttcggacgaccttgaaggcggttcttctattttgaagtggcttagctacgttccttctcatgta
H L T V S D D L E G V S S I L K W L S Y V P S H V
ggtggtgcacttccattgttaaagcccttgatccccagagagggaagtggagtatttaccggaaaattcatgc
G G A L P I V K P L D P P E R E V E Y L P E N S C
gatcctcgctgccatttccggaactctggatgttaatggaaagtggctgggaggcatttttgacaaggacagc
D P R A A I S G T L D V N G K W L G G I F D K D S
tttgtggagacactagaaggatgggctagaacagttgttacaggaagggaagccttggaggaatccctgtggga
F V E T L E G W A R T V V T G R A K L G G I P V G
attgttgcggtggaacacaaacagttatgcaaataatacctgctgatccaggtcaacttgattctcacgagagg
I V A V E T Q T V M Q I I P A D P G Q L D S H E R
gttgttctcaagccgggcaggtgtggttctgattctgcgaccaagacggcccaagcgatattggatttcaac
V V P Q A G Q V W F P D S A T K T A Q A I L D F N
agagaagaactcccacttttcattatcgcaaactggagaggcttttcaggtggacaaaggaccttttgaagga
R E E L P L F I I A N W R G F S G G Q R D L F E G
attcttcaggctggttcgactattgtggagaaccttaggacatacaaacagcccatatttgtatacattccaatg
I L Q A G S T I V E N L R T Y K Q P I F V Y I P M
atgggtgaactccgaggcggggcttgggttgttgcgacagccgaatcaactcagaccacattgaaatgtatgct
M G E L R G G A W V V V D S R I N S D H I E M Y A
gagcgaacggccaaaggtaacgtccttgagccggaagggaatgattgaaatcaaatttagaacaagagaattgttg
E R T A K G N V L E P E G M I E I K F R T R E L L
gagtgtatgagaagacttgatcaacaattgattaatttgaaggaaaaactttctgaagccaagagtaacaaggac
E C M R R L D Q Q L I N L K E K L S E A K S N K D
tatggtgcatatgattctctgcagcagcagattagattccgtgagaaacagcttttgcctttgtatactcagata
Y G A Y D S L Q Q Q I R F R E K Q L L P L Y T Q I
gtacaaaatttgcgtaactccatgatacttcattaagaatgaaagcaaagggtgtaatcagagaagttcttgat
A T K F A E L H D T S L R M K A K G V I R E V L D

Figure 4-5

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Figure 4-6